

University of Groningen

## **The effects of teacher expectation interventions on teachers' expectations and student achievement**

De Boer, Hester; Timmermans, Anneke C.; Van Der Werf, Margaretha P. C.

*Published in:*  
Educational Research and Evaluation

*DOI:*  
[10.1080/13803611.2018.1550834](https://doi.org/10.1080/13803611.2018.1550834)

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*  
Publisher's PDF, also known as Version of record

*Publication date:*  
2018

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

De Boer, H., Timmermans, A. C., & Van Der Werf, M. P. C. (2018). The effects of teacher expectation interventions on teachers' expectations and student achievement: narrative review and meta-analysis. *Educational Research and Evaluation*, 24(3-5), 180-200. <https://doi.org/10.1080/13803611.2018.1550834>

### **Copyright**

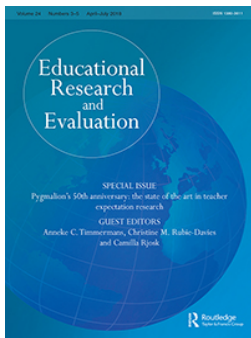
Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

### **Take-down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.



# Educational Research and Evaluation

## An International Journal on Theory and Practice

ISSN: 1380-3611 (Print) 1744-4187 (Online) Journal homepage: <https://www.tandfonline.com/loi/nere20>

# The effects of teacher expectation interventions on teachers' expectations and student achievement: narrative review and meta-analysis

Hester de Boer, Anneke C. Timmermans & Margaretha P. C. van der Werf

To cite this article: Hester de Boer, Anneke C. Timmermans & Margaretha P. C. van der Werf (2018) The effects of teacher expectation interventions on teachers' expectations and student achievement: narrative review and meta-analysis, Educational Research and Evaluation, 24:3-5, 180-200, DOI: [10.1080/13803611.2018.1550834](https://doi.org/10.1080/13803611.2018.1550834)

To link to this article: <https://doi.org/10.1080/13803611.2018.1550834>



© 2018 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 10 Dec 2018.



Submit your article to this journal [↗](#)



Article views: 1420



View Crossmark data [↗](#)

# The effects of teacher expectation interventions on teachers' expectations and student achievement: narrative review and meta-analysis

Hester de Boer , Anneke C. Timmermans  and Margaretha P. C. van der Werf

GION education/research, University of Groningen, Groningen, The Netherlands

## ABSTRACT

This study provides a systematic review of the effects of 19 teacher expectation interventions. Prior research on teacher expectations primarily focussed on correlational relationships with student and teacher characteristics, leaving open the questions of whether it is possible to raise teacher expectations and to prevent (too) low expectations from having detrimental effects on student achievement. These questions were the scope of the current review. We distinguished 3 types of interventions: changing teacher behaviour, creating awareness of expectancy effects, and addressing the beliefs underlying the expectations. The results indicated that it was possible to raise teacher expectations and subsequent student achievement. We found summary effects of Hedges'  $g = 0.38$  and  $0.30$ , respectively. The narrative review suggested that the intervention type did not affect the effectiveness, but teacher support for the intervention did. However, verification of this suggestion with moderator analysis was not possible due to the limited number of interventions.

## KEYWORDS

Teacher expectation interventions; review and meta-analysis; student achievement

## Introduction

Since the beginning of the research on teacher expectations, with the study *Pygmalion in the Classroom* by Rosenthal and Jacobson (1968) as the major seminal work, many studies in this subject have been published. These studies focussed on the occurrence of inaccurate teacher expectations and their relationships with other constructs, such as student academic achievement, demographic background, motivation and engagement, and teacher characteristics and beliefs (e.g., Jussim & Harber, 2005; Tenenbaum & Ruck, 2007). Teacher expectations of student achievement that are systematically too high or too low compared with actual student achievement level are called biased expectations (De Boer, Bosker, & Van der Werf, 2010; Timmermans, Kuiper, & Van der Werf, 2015). Teachers can have biased expectations for most students in their class (general bias) or for specific subgroups of students (specific bias) (Timmermans et al., 2015). The latter is sometimes referred to as differential teacher expectations

**CONTACT** Hester de Boer  [hester.de.boer@rug.nl](mailto:hester.de.boer@rug.nl)

© 2018 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group  
This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way.

(Van den Bergh, Denessen, Hornstra, Voeten, & Holland, 2010). Biased teacher expectations seem to be the product of student characteristics, such as students' gender, ethnicity, and socioeconomic status (SES) (e.g., De Boer et al., 2010; Timmermans et al., 2015). Recent findings suggest that, on average, teachers tend to have negatively biased expectations for the future academic performance of minority group students and students from less affluent families (e.g., Glock & Krolak-Schwerdt, 2013; Glock, Krolak-Schwerdt, Klapproth, & Böhmer, 2013; Rubie-Davies, Hattie, & Hamilton, 2006; Speybroeck et al., 2012; Tenenbaum & Ruck, 2007). Also, differences between teachers in the kind and degree of bias seem to be related to teacher variables, such as their background and differential beliefs between teachers concerning teaching (e.g., Rubie-Davies, 2007; Weinstein, 2002).

The importance of teacher expectations in facilitating students' learning has long been recognised (Rubie-Davies, 2008). On the basis of different reviews and meta-analyses, the average effect of teacher expectations on subsequent student performance has been found to be relatively small ( $r = .1$  to  $r = .2$ ; Jussim & Harber, 2005) to moderate ( $d = 0.43$ ; Hattie, 2009). Negatively biased teacher expectations have a detrimental influence on student achievement, whereas positively biased expectations have a positive influence on future student careers (De Boer et al., 2010). In particular, low achievers (Madon, Jussim, & Eccles, 1997) and students from low-income families and minority groups seem to be more susceptible to the detrimental effects of negatively biased teacher expectations (e.g., Hinnant, O'Brien, & Ghazarian, 2009; Jussim, Eccles, & Madon, 1996; McKown & Weinstein, 2008; Sorhagen, 2013).

In general, teacher expectations influence teacher behaviour and the subsequent performance of students (e.g., Bennet, Gottesman, Rock, & Cerullo, 1993; Brophy & Good, 1970; Ready & Wright, 2011; Rubie-Davies, 2007, 2008). Several studies have identified ways in which teachers treat students for whom they have high or low expectations differently (Brophy & Good, 1970; Hughes, Gleason, & Zhang, 2005; Tenenbaum & Ruck, 2007). When teachers have high or low expectations for students, they communicate their expectations both verbally and non-verbally (Babad, Bernieri, & Rosenthal, 1989). Relative to low-expectation students, teachers demonstrate a positive bias in evaluating the work of high-expectation students, provide them with more response opportunities, more challenging instruction, more praise, and interact with them in ways that are more supportive and caring (e.g., Babad, 1992; Brophy, 1983; Jussim & Eccles, 1992; Jussim et al., 1996). This differential treatment of high- and low-expectation students may account, at least partially, for the expectancy-confirming impact of teacher expectations on student achievement (Hughes et al., 2005). Differences in teacher expectations do not only exist within the classroom of one teacher, but also between teachers. The studies by Rubie-Davies (2007, 2010) pointed out that teachers differed in their average level of expectations for their students in the classroom, and that this was reflected in their teaching behaviour. High-expectation teachers spent more time on providing a framework for students' learning, provided more feedback, questioned their students by using more higher order questions, and managed the students' behaviour more positively compared with the teachers with a low level of average expectations. Based on the results of the studies described above, it seems that teachers who have lower expectations in general for their students, or towards particular (groups of) students, provide less opportunities to learn for these students.

### ***The current study***

The previous findings have indicated that it is important to address teacher expectations in educational practice. Despite the overwhelming amount of literature establishing associations between teacher expectations and student learning, too little work has been done when it comes to teacher expectation interventions. The prior research does provide suggestions, however, about how to raise teacher expectations and how to prevent (too) low and/or biased teacher expectations from having detrimental effects on student achievement. Generally, there seem to be three approaches to address teacher expectations through interventions (Cooper & Tom, 1984; De Boer et al., 2010; Research for Better Schools, 1987; Riley & Ungerleider, 2012; Rubie-Davies et al., 2006). The first is to instruct teachers to apply behaviours associated with high-expectation teachers. The second approach is to make teachers aware of the effects of teacher expectations on students and to explain that teacher expectations can be inaccurate and/or biased towards particular groups of students. The third approach focusses on addressing the beliefs of teachers that underlie the biased expectations towards student achievement.

Teacher expectation intervention studies may provide valuable information that correlational studies cannot provide, as they offer insights as to whether it is possible to raise (systematically too) low teacher expectations for students in general or for particular (groups of) students. Furthermore, such intervention studies may provide insights into the possibilities of preventing or correcting the negative effects of (too) low (or biased) expectations on student achievement and to evoke the positive effects of higher teacher expectations. In the current study, we reviewed the teacher expectation intervention studies that had been executed in a naturalistic setting, without artificial manipulation of teacher expectations. We believe that only these types of studies can provide insights into how to sustainably increase teacher expectations and/or their effects on student achievement, which have applicability in regular classrooms. In contrast to studies with manipulated expectations which are imposed on the teacher, studies in naturalistic settings request an active role of the teacher; it is the teacher who has to change her/his thinking and/or behaviour. Our research questions were:

- (1) What effect do teacher expectation interventions have on the level of teacher expectations?
- (2) What effect do teacher expectation interventions have on student academic achievement?

In this systematic review, we include intervention studies applying a variety of approaches including interventions aimed at changing teacher behaviour so that it was consistent with high-expectation practices, creating awareness of the influence of expectations, and addressing the beliefs of teachers related to their expectations. The findings of the intervention studies are synthesised into a narrative review and a quantitative meta-analysis (the latter only where possible).

## Method

### *Literature search*

We searched the ERIC and PsycINFO databases for intervention studies on teacher expectations. To identify as many published studies on the subject as possible, we used relatively broad search terms. We therefore not only searched for the term “teacher expectations” in the title of the studies, but also for related concepts, which might be used by researchers instead. Furthermore, we determined that the studies had to use a term in the title indicating the presence of an intervention study, or a term indicating a change in teacher expectations. We entered the following search in the databases:

TI (“teacher\* expect\*” OR “teacher\* judg\*” OR “teacher\* percept\*” OR “teacher\* aspir\*” OR “teacher\* belief\*”) AND TI (chang\* OR interven\* OR alter\* OR reduc\* OR decreas\* OR increas\* OR program\* OR treatment\* OR experiment\* OR instruct\* OR training\* OR rais\* OR prevent\* OR overcom\*).

The search was performed at the beginning of 2018, and we captured all studies published from the beginning of the first publications in the field (no starting date as limit) until the end of 2017. We included all types of publications and did not limit ourselves to peer-reviewed publications, because, as we did not expect to find many teacher expectation intervention studies, we wanted to include every study available. Our initial search yielded 1,307 hits.

### *Eligibility criteria*

The titles and abstracts of the search hits were scanned for potential eligibility. If there were indications that the study was a teacher expectation intervention, we selected it for a more thorough screening of the full text. The scanning of the titles and abstracts yielded 26 potentially relevant studies. Additionally, in these studies, we checked for references to other intervention studies, which yielded four more potentially eligible studies. We used the following eligibility criteria for our final selection:

- We included studies in which an intervention was tested to change teacher expectations, or to change the effects of low/and or biased teacher expectations on student achievement. We defined teacher expectations as a teacher’s estimate of student’s academic potential based on current knowledge about this student (Good, 1987; Riley & Ungerleider, 2012).
- The intervention was executed in a regular classroom setting, at any education level, without artificial manipulation of teacher expectations based on false information. Replications of the study of Rosenthal and Jacobson (1968) were therefore excluded, as they did not aim to evoke a sustainable change in teacher expectations, nor did they have direct applicability to regular classrooms.
- The study had to have a narrative description of changes in teacher expectations and/or students’ academic achievement as a result of the intervention in order to be included in the narrative review of teacher expectation interventions (qualitative research measures or a wordy description of the quantitative measures), and sufficient quantitative measures to be able to calculate an effect size and variance to be included in the meta-analysis.

There were 19 studies that met our eligibility criteria. Two studies were based on the same experiment and data, and they were therefore counted as one (Rubie-Davies, Peterson, Sibley, & Rosenthal, 2015; Rubie-Davies & Rosenthal, 2016).

Unfortunately, we noticed that not all studies had high-quality data reporting. Sometimes, it was only stated, for example, that the effect was or was not significant, without providing exact data details. In these cases, the study was only eligible for the narrative review and not for the meta-analysis. At other times, the research design was not optimal, because there was no control group or correction for pre-test differences in case a control group was included (by omitting to include a pre-test measure or by not randomly assigning participants to the conditions). Although we acknowledge that a good review should be based on studies of sufficient quality, the number of published intervention studies limited our capability to be too selective. We decided to include studies of lower quality, but to keep alert as to how data were established. Although the data reporting was low quality, such studies might still provide helpful insights into what worked and what did not in terms of influencing (biased) teacher expectations and/or raising student achievement. This is because most studies did provide a careful verbal if not quantitative evaluation of their studies. Of all the included studies, 12 provided sufficient statistical information and were eligible for the meta-analysis.

### *Coding for narrative review and meta-analysis*

To systematically review the intervention studies, we coded multiple characteristics of the interventions: the type of intervention, its duration in weeks, the student characteristics of the sample and the grade year in which it was executed, the country in which the study took place, the year of publication, the various outcome types, and its effect direction. Below, we describe the coding for the intervention types, for the student characteristics, and for the outcome types.

#### *Intervention types*

We coded the interventions for the presence of the following treatment approaches: (a) a focus on changing teacher behaviours (behavioural approach), (b) a focus on creating general awareness among teachers of the effects of teacher expectations on student achievement and/or awareness that teacher expectations can be inaccurate and/or biased towards particular groups of students, (c) a focus on addressing teachers' own beliefs about students' academic abilities, and (d) a focus on other approaches. A study could combine multiple approaches.

#### *Student characteristics of the sample*

This aspect was coded to get a more complete picture of the context in which the intervention was implemented. We distinguished: average students, low-SES students, ethnic minority students, low-achieving students, and special needs students.

#### *Outcome types*

We coded academic outcomes of student achievement and outcome measures of teacher expectations; the latter defined as a teacher's estimate of students' academic potential. For both outcome types, the direction of the effect was coded, and when possible the effect

size and its variance were computed. We also coded the instrument with which the outcomes were measured.

### Meta-analysis

We performed a meta-analysis on the studies that provided sufficient data to calculate an effect size. For this, the statistical package Comprehensive Meta-Analysis (CMA) Version 2, developed by Biostat (see: [www.meta-analysis.com](http://www.meta-analysis.com)) was used. CMA computed the effect sizes in Hedges'  $g$  and variances of the individual interventions. Hedges'  $g$  is similar to Cohen's  $d$ , but, unlike the latter, is unbiased for small sample sizes and thus the preferred effect size for meta-analysis. Following Cohen (1988), a Hedges'  $g$  of 0.2, 0.5, and 0.8, respectively, reflect a small, moderate, and large effect. In several studies, multiple measurement results of the same outcome type were provided. Timperley and Phillips (2003), for example, applied six literacy skills and knowledge subtests. We included all these measures in our meta-analysis, and let CMA calculate the mean effect for the particular intervention, which was then used as an estimate of the study's intervention effect in the meta-analysis.

In one study, the means and standard deviations that were provided were aggregated at the class level (S. C. Jones, 1990). We here first computed the effect size based on these data in CMA, and then applied a transformation to it to make the effect size and variance comparable with the other effect sizes that were measured based on individual-level data, as prescribed by Hedges (2007). We multiplied the effect size with the square root of the intra-class correlation value, and the variance was multiplied with the intra-class correlation value. We estimated the intra-class correlation at 0.1, as indicated by the study of Hedges and Hedberg (2007).

We calculated the average weighted effect size of all studies, and we did this for the outcome types "academic achievement" and "teacher expectations" separately. Studies with smaller variances were attached more weight in calculating the average effect. The variance of a study reflects the measurement precision and depends to a large extent on its sample size, with larger samples having lower variances. We used a random effects model to estimate these summary effects, because the interventions in our meta-analysis differed in many respects, and thus we assumed no common effect size but a distribution of effect sizes.

Furthermore, we analysed if our meta-analysis was subject to any publication bias. Therefore, we utilised Duval and Tweedie's *Trim and fill* procedure (Borenstein, Hedges, Higgins, & Rothstein, 2009; Peters, Sutton, Jones, Abrams, & Rushton, 2007). This method is based on the idea that publication bias leads to an uneven distribution of the primary study's effect sizes around the mean effect in a funnel plot (in which the study's measurement precision is taken into account). The Duval and Tweedie's method explores if the symmetry of the distribution can be optimised by imputing (filling in) trimmed values of the most extreme effect sizes, but with opposite effect direction. We used a random effects model to determine the degree of publication bias.

## Results

### Sketch of the interventions

Table 1 provides an overview of the characteristics of each intervention study. It shows that most teacher expectation interventions consisted of multiple components. There



**Table 1.** Characteristics of the teacher expectation interventions.

First author	Pub. year	Behaviour interv.	Awareness interv.	Beliefs interv.	Other interv.	US grade year.	Student characteristics	Duration (weeks)	Eff teacher expectation	Eff student achievement
Barnes	1973	No	No	Yes	No	Pre-teach	N.a.	1	+ <sup>q</sup>	n.a.
Cooper	1977	Yes	Yes	No	No	1, 2	Average	35	n.a.	n.a. + <sup>n</sup>
Dagley	1988	Yes	Yes	No	No	2 to 5	Low SES	13	n.s. – <sup>q</sup>	n.a.
Dworkin	1979	Yes	No	No	No	1 to 3	Low achiev	3	+ <sup>q</sup>	0 <sup>n</sup>
Fisher	2013	No	Yes	No	No	4 to 6	Low SES, ethnic min.	1	0/+ <sup>q</sup>	n.a.
Good & Brophy	1974	Yes	No	No	No	1	Low SES	14	0 <sup>n</sup>	n.a.
Gottfredson et al.	1995	Yes	Yes	No	No	1, 2, 3, 5	Average	22	n.a.	0/– <sup>q</sup>
Jones, J. N.	2012	No	Yes	No	Yes	7 to 12	Low SES, ethnic min.	Years?	+ <sup>n</sup>	n.a.
Jones, S. C.	1990	Yes	Yes	No	No	9 to 12	Average	22	n.a.	n.s. + <sup>q</sup>
Kerman	1979	Yes	Yes	No	No	1 to 12	?	22	n.a.	+ <sup>n</sup>
Kohler	1987	Yes	Yes	No	No	4 to 6	Spec need, ethnic min.	22	n.a.	n.s. +
Perrella	2017	Yes	Yes	No	No	K to 2	Average	120	0/+ <sup>n</sup>	n.a.
Reiter & Davis	2011	No	No	Yes	No	Pre- teach	n.a.	40	0 <sup>q</sup>	n.a.
Rubie-Davies et al.	2015	Yes	Yes	No	No	2 to 7	Average	40	n.a.	0/+ <sup>q</sup>
Smith	2007	No	No	Yes	No	Teachers	Low SES	6	+ <sup>n</sup>	n.a.
Timperley & Phillips	2003	No	Yes	Yes	Nes	1	Low SES	26	+ <sup>n</sup>	+ <sup>q</sup>
Warren	1989	Yes	Yes	No	No	9	Low SES	10	n.a.	+ <sup>q</sup>
Weinstein et al.	1991	Yes	Yes	No	No	9	Low SES, ethnic min.	40	+ <sup>n</sup>	+ <sup>q</sup>
Williams et al.	1994	Yes	No	Yes	No	Teachers	Low SES	26	0 <sup>n</sup>	n.a.

Notes: Pre-teach = pre-service teacher. Effect direction: + = positive, – = negative, 0 = effect around zero, not significant; n.s. = not significant, n.a. = not available; <sup>n</sup> based on narrative/qualitative data; <sup>q</sup> based on quantitative data.

were only five of the 19 interventions in which one type of intervention was implemented. About half the interventions combined creating a general awareness of teacher expectation effects with an approach to change teacher behaviour. The duration of the studies varied largely. There were three studies with a maximum duration of 3 weeks (Barnes, 1973; Dworkin, 1979; Fisher, 2013), four studies with a duration between 3 weeks and 3 months (Dagley, 1988; Good & Brophy, 1974; Smith, 2007; Warren, 1989), and three studies with a duration of more than one school year (J. N. Jones, Miron, & Kelaher-Young, 2012; Kerman, 1979; Perrella, 2017). All other studies had a duration between 5 months and 1 school year. The interventions focussed on primary and secondary school students and teachers, and both education levels were well represented. In nine interventions, the student sample consisted of low-SES students, whereas in four interventions ethnic minority students formed a large proportion of the sample.

Most teacher expectation interventions included in the review were performed in the US; only two were performed outside the US, namely, in New Zealand. These were the studies of Rubie-Davies et al. (2015) and Timperley and Phillips (2003). The teacher expectation interventions mostly focussed on changing low teacher expectations in general (e.g., Rubie-Davies et al., 2015), on teacher expectations for low achievers (e.g., Weinstein, Soule, Collins, Cone, Mehorn, & Simontacchi, 1991), for low-SES students (e.g., Timperley & Phillips, 2003), for minority students (e.g., Barnes, 1973), and for students at risk of dropping out of school (e.g., Warren, 1989). The review included five studies in which the same programme was tested, that is, “Teacher Expectations and Student Achievement” (TESA) (Gottfredson, Marciniak, Birdseye, & Gottfredson 1995; S. C. Jones, 1990; Kerman, 1979; Kohler, 1987; Warren, 1989).

### ***Intervention effects on teacher expectations***

We first provide a narrative review of the results with regard to the effects of the interventions on teacher expectations, then we present the results of the meta-analysis.

#### ***Narrative review of intervention effects on teacher expectations***

In 12 interventions, the effects on teacher expectations were measured. Six of them found a positive effect, two reported a mixed no/positive effect, and four reported that the intervention had no significant effect on the teacher expectations.

**Positive effects.** The studies in which teacher expectations were positively affected by the intervention varied in approach. Barnes (1973) set up a fully experimental study to test a 1-day self-instructional module, which addressed teacher beliefs with respect to the attitudes and values of educationally disadvantaged inner-city Black youth. Barnes found a positive change in pre-service teachers’ perceptions of the abilities of Black youth in the experimental group compared with the control group. Dworkin (1979) also set up a full experiment and examined an intervention starting with a whole day of instruction to teachers in positive teacher behaviours. During this day, teachers collaborated with the researcher to select a limited set of objectives to work on. After 3 weeks of practising, teachers’ expectations of students’ performance and behaviour had increased more in the experimental group than in the control group.

Weinstein et al. (1991) employed a pre-experimental design to evaluate the effects of their collaborative expectancy communication model on teachers' expectations. The researchers provided teachers and other educational personnel in the school with information on the existence of teacher expectation bias and teacher expectancy effects. Furthermore, they introduced a theoretical model on how to communicate positive expectations to students and to create a positive expectancy climate in the school. Rather than implying changes to teachers, the researchers opted for a collaborative development of the model with teachers and school staff, and they organised regular weekly meetings during the whole school year to translate the research findings into practice. The intervention was designed with the whole school team, with the intent of evoking a school-wide change. The multiple partners involved did not make it easier to evoke change, and the programme suffered from many struggles, but one conclusion was that it was probably the collaboration between the researchers and the school team that made the project continue to have a life of its own, beyond the contributions of the researchers. Narrative records of the project meetings indicated that the intervention affected teachers' general expectations as it changed the teachers' focus from students' deficits to students' capabilities.

Timperley and Phillips (2003) implemented a professional development programme in schools in low-income communities with a focus on increasing teacher expectations, by means of increasing teaching knowledge and skills. They used a pre-experimental design to evaluate the effects on teachers' expectations. The programme consisted of 10 sessions of 3 hr each, spread over 6 months. The researchers made teachers aware that students from low-income areas could also reach a certain target level in reading achievement, given a particular approach. They also addressed teachers' beliefs by making teachers understand the connection between what they taught and what students learnt, and they implemented achievement-data-related activities which helped teachers assess, monitor, and record students' achievement (in Table 1 coded as "other intervention type"). A questionnaire, filled in by teachers prior to and at the end of the programme, indicated that teachers' expectations had increased. Interviews with the teachers revealed that the improved reading achievement of the students as a result of the programme seemed to be the reason why teachers actually had increased teacher expectations about the progress low-SES students could make in their first year of school.

The findings of the pre-experimental study of Smith (2007), who focussed on three teachers' negative beliefs about transient students' achievements, pointed in the same direction. When the teachers were presented abstract information, in the form of research papers, they did not change their beliefs. However, when the researcher presented the teachers with the actual achievement data of the transient students in their own school compared with the other students, showing no difference in average achievement level between both groups, the teachers did change their beliefs accordingly. These data were presented within the context of a study group in which the three teachers took part. The discussion among the three teachers that followed in the next session of the study group after the presentation of these data appeared vital in the process of changing the teachers' expectations and practices.

Finally, J. N. Jones et al.'s (2012) pre-experimental study had a somewhat deviating approach from the other interventions, as in this study the educational opportunities of students were directly influenced by offering scholarships to students for local colleges

(in Table 1 coded as “other intervention type”). The teachers were made aware that their general expectations for students had to be heightened, as college was a realistic option for their students after graduating from high school. The availability of educational opportunities had excited teachers, and interviews with teachers and students indicated that teachers had increased their expectations for students.

**Mixed effects.** Fisher (2013) and Perrella (2017) found mixed results. Both intervention studies focussed on increasing teachers’ recognition of the talents of culturally diverse students. Perrella, furthermore, taught teachers how to develop students’ talents. Fisher used a quasi-experimental research design without a pre-test to evaluate the intervention effects by letting teachers in the intervention group and comparison group respond to two statements at the end of 5 days of treatment. She did not measure significant differences in teacher expectations with regard to the statement that African American students entering school at a disadvantage are unlikely to catch up, but did notice more positive teacher expectations in the intervention group compared with the comparison group with regard to the statement that non-standard English and African American Vernacular English prevented students from performing well enough in school to be nominated for gifted programmes. This measurement instrument might not be very precise, however, in estimating teacher expectations. Perrella employed a pre-experimental design to evaluate the intervention effects. She did find improvements in teacher expectations, but also signalled that there was still negative bias towards culturally diverse students. Perrella noticed that the 2-year programme that was implemented did not receive widespread support from the teachers. The teachers felt the programme was additional work, and they signalled a lack of collaborative opportunities and discussion with other teachers. This might have constrained the change in teachers’ expectations towards culturally diverse students.

**No effects.** The studies reporting no significant effect seemed to have suffered from poor implementation (Dagley, 1988; Reiter & Davis, 2011; Williams, Newcombe, Woods, & Buttram, 1994), and, in the case of Good and Brophy (1974), a measurement instrument that had its limitations, as it measured the teacher expectations of the target students relative to the non-target students in the classroom (teachers had to rank their students in order according to the levels of achievement they expected from them), instead of the absolute teacher expectations.

Good and Brophy’s (1974) intervention consisted of a single interview in which teachers received personalised feedback on their own differential behaviour towards certain groups of students. The feedback was based on 40 hr of observations in the classroom. During the interview, the teacher and researcher collaboratively decided what adjustments had to be implemented to improve the teacher behaviours towards the target students who received the least positive teacher–student interactions. Then, teachers had 3 months to implement the changes. The intervention effect was evaluated in a pre-experimental way. According to the researchers, the collaborative aspect created teacher support for the intervention. Teachers perceived the intervention as helpful and relevant, and teacher behaviour improved towards target students who were labelled as low participants (low rates of interaction with teachers). However, teacher behaviour towards another group of target students, for whom teachers seemed to lack the willingness to

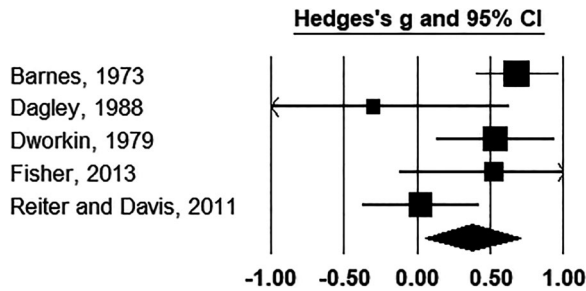
give them a second response opportunity when they failed on the first opportunity, did not improve. Not only did the behaviours towards the first target students improve, but also towards non-target students, which might at least partially explain why the relative teacher expectations for the first target group did not change.

Dagley (1988) was the next study reporting no significant intervention effect. Dagley tested a staff development programme designed to train teachers in the use of cognitive self-instruction to monitor teaching behaviour related to communicating teacher expectations, with a focus on increasing teacher expectations for at-risk students. The study was set up in a fully experimental manner. During 4-monthly training sessions of 3 hr each, teachers had to develop self-statements to help them implement the desired teacher–student interactions. In the time between the training sessions, teachers had to practise these self-statements. Dagley attributed the failure to measure increases in teacher expectations with respect to students' academic achievement and teachers' perceptions of their responsibility in influencing student achievement to several possible reasons: Teachers did not voluntarily participate in the programme, and would therefore not be motivated for self-instruction; the experimental group might have shared information with the control group, which contaminated the experiment; and a final explanation was that teachers already had high expectations at the beginning, which made it more difficult to increase them. However, Dagley also remarked that it might be the content of the intervention itself that was not effective, but unfortunately she did not explain this statement any further.

Williams et al. (1994) blamed the way teachers were trained for the lack of an effect on teacher expectations in their pre-experimental study. The researchers first trained the trainers, who then subsequently had to train the teachers. This negatively affected the transmission of the complex body of information on behavioural strategies and beliefs about (low-SES) urban learners provided during the intervention, which consisted of one orientation session and five programme sessions of 2.5 hr each. The four themes addressed were: cultural diversity and learning, unrecognised abilities and underdeveloped potential, enhancing ability development through motivation and effort, and, lastly, resilience. Reiter and Davis (2011) explained their lack of effect on teacher expectations (measured as the extent to which pre-service teachers perceived students' background characteristics as influential on their learning in the intervention group compared with the comparison group) by the fact that the intervention with weekly seminars over the course of two semesters was rather celebratory and was made up of isolated modules, focussed on beliefs about cultural diversity and learning, which pre-service teachers "ticked off" after which they did not look back at anymore. The pre-service teachers thus did not incorporate the knowledge. The researchers had employed a quasi-experimental research design without pre-test.

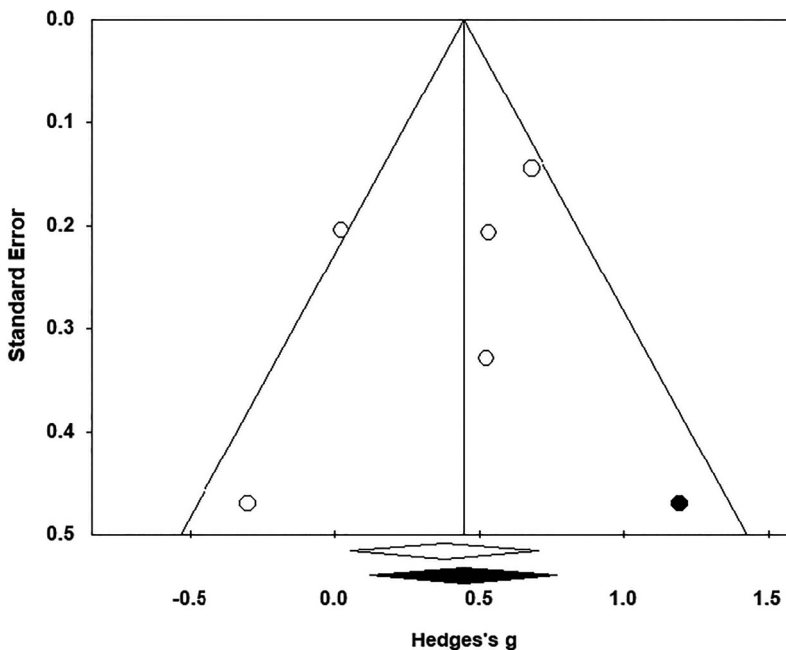
### *Meta-analysis of intervention effects on teacher expectations*

Five studies provided sufficient quantitative data for the intervention effects on teacher expectations to enable further analyses. We performed a meta-analysis on these studies and found an average weighted effect size of Hedges'  $g = 0.38$  ( $SE = 0.17$ ,  $p = 0.023$ , 95% confidence interval of 0.05 to 0.70). This is a small to moderate, but significant effect. Figure 1 shows the forest plot of this analysis. We examined whether the meta-analysis suffered from publication bias and found that one study was missing to the right of the



**Figure 1.** Forest plot of the teacher expectation effects and the 95% confidence interval of the interventions (represented by a square; interventions with larger sample sizes are represented by a bigger square), plus the summary effect (represented by a diamond).

mean. The estimated unbiased Hedges's  $g$  was slightly higher with a value of 0.44 (95% confidence interval of 0.12 to 0.77); thus, taking publication bias into account did not change the overall conclusion that teacher expectation interventions can raise teachers' expectations. Figure 2 shows the funnel plot in which the observed and imputed effect sizes are displayed. There was some heterogeneity among the effect sizes of the primary studies ( $Q = 9.71$ ,  $df = 4$ ,  $p = 0.046$ ), and  $I^2 = 58.8$  indicated that a moderate part of the variation in effect sizes reflected real differences in effect sizes between the studies. The description of the studies above already showed that the studies differed with respect to the types of interventions that were implemented, and also with respect



**Figure 2.** Funnel plot of standard error by teacher expectation effect of the interventions.

Note: The observed interventions are represented by an open circle, the imputed intervention by a filled circle. The diamonds at the bottom represent the summary effect and its confidence interval, the open diamond for the observed interventions only, the filled diamond for the observed and imputed interventions.

to other characteristics. The variance in true effect sizes was estimated at  $T^2 = 0.074$ . Unfortunately, the limited number of interventions in the meta-analysis did not allow for moderator analyses to examine which type of intervention, or combination of intervention types, had the greatest effects.

## ***Intervention effects on student achievement***

### ***Narrative review of intervention effects on student achievement***

The review included 10 teacher expectation interventions in which the effect on student achievement was described. Four of them found a positive effect, three found effects that were not significant but did show changes in the desired direction, and one study found mixed effects, depending on the outcome measure. Two other studies found no positive effects at all.

Weinstein et al. (1991) and Timperley and Phillips (2003) reported positive effects of their interventions on the teacher expectations (as described above), as well as on student achievement. In contrast to their measurements of the effects on teacher expectation, the effectiveness on student achievement was measured in a quasi-experimental study. In the study of Weinstein et al., the comparison sample was drawn from a comparable group of students in the two cohort years prior to the intervention. A pre-test was included to control for initial differences. Timperley and Phillips contrasted the student achievement of the intervention group with a comparison group, but they did not control for pre-test differences.

Rubie-Davies et al. (2015) found mixed effects. They set up a large-scale fully experimental study to test a school-year-long intervention in which in four workshops, each lasting a whole day, primary school teachers received a thorough introduction to teacher expectation research and were shown the advantages of high teacher expectations for student achievement. Furthermore, the intervention focussed on practising teacher behaviours related to high-expectation teachers. These behaviours were based on three key principles: using mixed ability grouping and providing challenging learning activities, promoting a positive class climate and goal setting (promoting student autonomy, motivation, and engagement and teacher evaluation and feedback). To promote ownership of the intervention among teachers, the teachers were allowed to choose the behaviours they would practise. During the year, the researchers met several times with the teachers to discuss how things were going and to provide support. At the end of the school year, the experimental students had higher maths gains compared with the control group, but not higher reading gains. It appeared that teachers had implemented the intervention to a higher degree in the mathematics lessons than in the reading lessons, because teachers found this was easier. A study on the same data showed that all students, irrespective of their gender, SES, ethnicity, and grade year, benefitted from the intervention compared to the control group students (Rubie-Davies & Rosenthal, 2016).

Five studies with student achievement measures examined the TESA programme. TESA (developed by Kerman, 1979) focussed on fostering teacher behaviour related to high expectations. There were 15 behaviours instructed, categorised in three strands: response opportunities, feedback, and personal regard. Furthermore, researchers discussed with the participating teachers the possible reasons for the differential treatment towards students

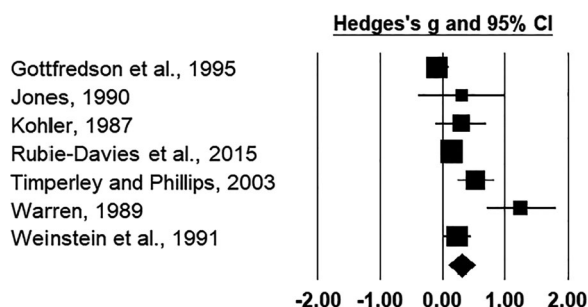
related to low and high expectations, and informed teachers about the research findings in the teacher expectation field. The TESA programme consisted of five workshops of 3 hr each. The descriptions of the implementation of the five studies, however, indicated that the awareness component did not seem to receive much attention. The goal of TESA was to create supportive and motivating teacher–student interactions for all students, with the aim to create equal opportunities in the classroom. Two of the five TESA studies were fully experimental (S. C. Jones, 1990; Kohler, 1987), two were quasi-experimental and included a pre-test (Gottfredson et al., 1995; Warren, 1989), and the study of Kerman (1979) was not described very well, but seemed to be at least quasi-experimental and with a pre-test included. Both Kerman (1979) and Warren (1989) found positive effects of TESA on student achievement. S. C. Jones (1990) and Kohler (1987), the latter examining the effects for special needs students, found positive effects, but these were not significant. Kohler reported that observations showed that some but not all participating teachers improved their teacher–student interactions. The fifth TESA study, of Gottfredson et al. (1995), compared the effects of an intervention group with two different comparison groups on reading and math tests for students in Grades 1 to 5. The overall picture of the outcomes on the various tests was that the intervention effect was close to zero (some tests yielded small effects in a positive, some in a negative direction). In sum, the findings of the five studies that examined the influence of the TESA programme on student achievement were inconclusive, but suggested, on average, a positive trend, whether or not significant.

Dworkin (1979) was one of the (fully experimental) studies finding no effect of her intervention on student achievement, but she did find positive changes in teacher expectations, as described above. It might be that the 3 weeks duration of the study was too short to measure increases in student achievement. Cooper (1977) tested an intervention in which six primary school teachers were instructed to refrain from criticising some students. The teachers were also informed about the negative effects of criticism and negative expectations on student performance. The intervention consisted of two meetings with 1 month in between, and then 6 months of practice. Differences were compared between the three most alterable teachers and the three least alterable. Cooper found only marginal differences in reading gains between the students of both groups of teachers, although in the desired direction. Unfortunately, the study lacked a proper control group, as half of the intervention group actually served as the control, which makes the study design pre-experimental.

### *Meta-analysis of intervention effects on student achievement*

Seven studies reported sufficient quantitative data for the effect on student achievement to be further analysed. The average weighted effect size of these studies was Hedges'  $g = 0.30$  ( $SE = 0.11$ ,  $p = 0.005$ , 95% confidence interval of 0.09 to 0.51). This is a small, but significant positive effect. Figure 3 shows the forest plot. Analyses indicated that there was no publication bias. There was heterogeneity among the primary study's effect sizes, as indicated by  $Q = 30.43$ ,  $df = 6$ ,  $p < 0.001$ , and most of this was true variance between studies instead of random error, as suggested by  $I^2 = 80.3$ . This means that the studies did not share the same true effect size and that differences between the studies (like the intervention content) may explain these differences. The absolute variance of the true effect sizes was  $T^2 = 0.052$ . Again, however, the meta-analysis included too small a number of





**Figure 3.** Forest plot of the effects on student achievement and the 95% confidence interval of the interventions (represented by a square; interventions with larger sample sizes are represented by a bigger square), plus the summary effect (represented by a diamond).

interventions to perform moderator analyses for the type of intervention. Also, because it appeared that there was a distinction with respect to the intervention types: “behaviour” and “beliefs” yielded a comparison between just one intervention in the category “behavioural approach not included” and six interventions in the category “behavioural approach was included”, one intervention in the category “beliefs were addressed”, and six interventions in the category “beliefs were not addressed”. All seven interventions included “awareness”.

## Discussion

Prior research on teacher expectations of students’ educational capabilities has mainly focussed on the student characteristics to which the expectations relate, and how the level of teacher expectations affects student achievement. This research has provided valuable insights, and showed the need to address teacher expectations in educational practice. However, as the theory on teacher expectations has developed over the years since Rosenthal and Jacobson (1968) published their famous study, there is still a knowledge gap in whether it is possible to raise teacher expectations, and whether it is possible to prevent the negative effects of low or biased teacher expectations on student achievement. The current review addressed these issues by analysing the effects of 19 teacher expectation interventions. The interventions focussed on changing teacher behaviour, on creating awareness of teacher expectation effects and/or the existence of teacher expectation bias, or on addressing the beliefs that underlie teacher expectations. Most interventions implemented a combination of approaches, and the combination of a behavioural approach with creating awareness was practised the most (in about half of the interventions).

The results of the review indicated that it is indeed possible to raise teacher expectations and that it is also possible to increase student achievement with teacher expectation interventions. A meta-analysis on the studies which provided quantitative data yielded an average effect on teacher expectations of Hedges’  $g = 0.38$  (95% confidence interval of 0.05 to 0.70), and on student achievement of 0.30 (95% confidence interval of 0.09 to 0.51). Unfortunately, only three studies examined both the effects on teacher expectations and on student achievement. Therefore, it is difficult to analyse whether

increasing teacher expectations also actually affects student achievement. Dworkin (1979), Timperley and Phillips (2003), and Weinstein et al. (1991) all found positive effects of their interventions on teacher expectations, and the last two found positive effects on student achievement as well. Dworkin found no positive effect on student achievement, but this might well be explained by the short duration of 3 weeks of the study, which might have been too short a period for noticeable changes in student achievement as a result of heightened teacher expectations.

The narrative review suggested that the type of intervention (behavioural, awareness, or beliefs) was not necessarily related to the intervention effect, although we should note that the limited number of intervention studies did not permit a proper moderator analysis. The studies in this review did make quite clear, however, that teacher support for the intervention was essential, as the interventions with disappointing results often reported that the intervention was not incorporated by the teachers and was therefore not well implemented (e.g., Perrella, 2017; Reiter & Davis, 2011). Studies in which teacher support was deliberately enhanced by enabling teacher collaboration in the intervention programme and design noticed that this contributed to the intervention's effectiveness (Dworkin, 1979; Good & Brophy, 1974; Rubie-Davies et al., 2015; Weinstein et al., 1991).

Teacher collaboration in the design and content of the intervention is not the only way to motivate teachers to change. First of all, teachers have to realise the need to change. For this, teachers should be provided with information that shows how teacher expectations affect their behaviour towards students, and thereby the academic outcomes of students, and that teacher expectation bias exists. This is the awareness component we distinguished, and it should be given substantial attention if the intervention is to be effective. Addressing teachers' underlying beliefs is also an option to create support for behavioural changes. Many interventions in our review were coded as having an awareness or beliefs component, but we were unable to detect a moderating effect of these intervention types on the summary effect of the interventions. We hypothesise that effectively creating awareness and changing beliefs is quite complex and is sensitive to how these components are actually addressed, and that this is why not all intervention studies were able to effectively employ these components. Timperley and Phillips (2003) and Smith (2007) were able to create teacher support for the intervention by making very clear to the teachers that also (particular groups of) students of these teachers were able to reach certain educational levels, whereby information on achievement of their own students seemed to have a larger impact than more abstract information in the form of research papers. Another example of how to create teacher support for the intervention was found in the study of Good and Brophy (1974). Here, awareness was likely created indirectly by providing teachers with personalised information, based on observations in the classroom, about their own differential behaviours towards different students, and how this affected the students.

### **Limitations**

The review suffered from the restricted number of studies that were included. Although this is an important finding in itself, it particularly limited our options to examine which intervention characteristics contribute to effectiveness. We might have found more

studies if we had elaborated our literature search. We searched for specific (combinations of) words in the titles, but an extension to searching the abstracts, or for other combinations of words, could have resulted in more eligible studies. However, part of this limitation should be overcome by the fact that we also searched for teacher expectation intervention studies mentioned by the already selected studies. Furthermore, we did not apply stringent eligibility criteria with regard to the methodological quality of the studies, and not all studies provided quantitative data, which hindered both the comparison of the effects between the studies and the statistical options to perform moderator analyses. Another limitation pertained to the countries in which the studies were executed. Only the US and New Zealand were represented in the current review, but teacher expectation interventions might work out differently in other countries with different education systems, differences in the groups and contrasts between students available, and other teacher training programmes.

### ***Recommendations for future research and practice***

The current, exploratory review indicated that teacher expectation interventions have promising effects on students and teachers. We therefore encourage researchers and practitioners to design and implement teacher expectation interventions, with special attention to creating a broad basis of support among the teachers, not only prior to the intervention but also during the implementation. The review suggested that this can be done by providing teachers with concrete information on teacher expectation effects that is closely linked to their own classroom context and by involving teachers in the design and implementation of the intervention. We would encourage researchers to use the knowledge on teacher expectation interventions from this overview and test such interventions in various contexts.

Furthermore, we recommend researchers to make use of a randomised pre-test-post-test control group design and to provide quantitative measures of teacher expectations and student achievement (preferably on standardised tests). This design has two advantages. The first is that the pre-test measures of student achievement and teacher expectations help to gain insight into the extent to which teacher expectations are actually biased and, if so, if this is a specific bias towards certain (groups of) students or a general bias towards all students. With this information, the necessity and focus of the intervention can be better determined. Second, the intervention effects of various studies can be more easily compared and synthesised. This will add to knowledge about which intervention characteristics are most beneficial, and whether teacher expectation interventions have the same effect in different contexts.

### **Acknowledgement**

This research did not receive any specific grants from funding agencies in the public, commercial, or not-for-profit sectors.

### **Disclosure statement**

No potential conflict of interest was reported by the authors.

## Notes on contributors

**Hester de Boer** is a post-doc researcher at GION education/research of the University of Groningen, The Netherlands. Her research interests include expectations and aspirations of teachers and parents and their influence on student academic performance, and the effects of the attributes related to the implementation and evaluation of educational intervention studies. Her methodological expertise is in meta-analysis.

**Anneke C. Timmermans** is assistant professor at the Faculty of Behavioural and Social Sciences of the University of Groningen, The Netherlands. Her research interests are in teacher expectations, factors related to the transition from primary to secondary schools in tracked educational systems, multilevel modelling, and the validity and reliability of school performance indicators. In 2016, Anneke received an Early Career Researcher Award from the *British Journal of Educational Psychology* for the paper "Accurate, inaccurate, or biased teacher expectations: Do Dutch teachers differ in their expectations at the end of primary education?".

**Margaretha P. C. van der Werf** is full professor Learning and Instruction and Vice Dean of the Faculty of Behavioural and Social Sciences at the University of Groningen, The Netherlands. Her main interests and expertise include educational effectiveness, civics and citizenship education, and the influence of psychological precursors of school success.

## ORCID

Hester de Boer  <http://orcid.org/0000-0001-8077-8987>

Anneke C. Timmermans  <http://orcid.org/0000-0003-2017-7818>

## References

- Studies included in the narrative review and/or meta-analysis are preceded by an asterisk.
- Babad E. (1992). Teacher expectancies and nonverbal behavior. In R. S. Feldman (Ed.), *Applications of nonverbal behavioral theories and research* (pp. 167–190). Hillsdale, NJ: Erlbaum.
- Babad, E., Bernieri, F., & Rosenthal, R. (1989). Nonverbal communication and leakage in the behavior of biased and unbiased teachers. *Journal of Personality and Social Psychology*, 56, 89–94. doi:10.1037/0022-3514.56.1.89
- \*Barnes, E. M. S. (1973). *The effects of using a self-instructional module on teacher perceptions of attitudes and values of disadvantaged inner-city black youth* (Unpublished doctoral dissertation). Ohio State University, Columbus, OH.
- Bennett, R. E., Gottesman, R. L., Rock, D. A., & Cerullo, F. (1993). Influence of behavior perceptions and gender on teachers' judgments of students' academic skill. *Journal of Educational Psychology*, 85, 347–356. doi:10.1037/0022-0663.85.2.347
- Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2009). *Introduction to meta-analysis*. Chichester: Wiley.
- Brophy, J. E. (1983). Research on the self-fulfilling prophecy and teacher expectations. *Journal of Educational Psychology*, 75, 631–661. doi:10.1037/0022-0663.75.5.631
- Brophy, J. E., & Good, T. L. (1970). Teachers' communication of differential expectations for children's classroom performance: Some behavioral data. *Journal of Educational Psychology*, 61, 365–374. doi:10.1037/h0029908
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.
- \*Cooper, H. M. (1977). *Intervening in expectation communication: The "alterability" of teacher expectations*. Columbia, MO: Center for Research in Social Behavior.
- Cooper, H. M., & Tom, D. Y. H. (1984). Teacher expectation research: A review with implications for classroom instruction. *The Elementary School Journal*, 85, 76–89. doi:10.1086/461393

- \*Dagley, P. L. (1988). *The utility of cognitive self-instruction in altering teacher expectations and locus of control orientations* (Unpublished doctoral dissertation). University of Georgia, Athens, GA.
- De Boer, H., Bosker, R. J., & Van der Werf, M. P. C. (2010). Sustainability of teacher expectation bias effects on long-term student performance. *Journal of Educational Psychology*, 102, 168–179. doi:10.1037/a0017289
- \*Dworkin, N. E. (1979). Changing teachers' negative expectations. *Academic Therapy*, 14, 517–531.
- \*Fisher, T. A. (2013). *The impact of multiple intelligence theory on teacher perception of giftedness and the referral of African American students to gifted and talented education programs* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 1434728)
- Glock, S., & Krolak-Schwerdt, S. (2013). Does nationality matter? The impact of stereotypical expectations of student teachers' judgments. *Social Psychology of Education*, 16, 111–127. doi:10.1007/s11218-012-9197-z
- Glock, S., Krolak-Schwerdt, S., Klapproth, F., & Böhmer, M. (2013). Beyond judgment bias: How students' ethnicity and academic profile consistency influence teachers' tracking judgments. *Social Psychology of Education*, 16, 555–573. doi:10.1007/s11218-013-9227-5
- Good, T. L. (1987). Two decades of research on teacher expectations: Findings and future directions. *Journal of Teacher Education*, 38, 32–47. doi:10.1177/002248718703800406
- \*Good, T. L., & Brophy, J. E. (1974). Changing teacher and student behavior: An empirical investigation. *Journal of Educational Psychology*, 66, 390–405. doi:10.1037/h0036499
- \*Gottfredson, D. C., Marciniak, E. M., Birdseye, A. T., & Gottfredson, G. D. (1995). Increasing teacher expectations for student achievement. *The Journal of Educational Research*, 88, 155–163. doi:10.1080/00220671.1995.9941294
- Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Abingdon: Routledge.
- Hedges, L. V. (2007). Effect sizes in cluster-randomized designs. *Journal of Educational and Behavioral Statistics*, 32, 341–370. doi:10.3102/1076998606298043
- Hedges, L. V., & Hedberg, E. C. (2007). Intraclass correlation values for planning group-randomized trials in education. *Educational Evaluation and Policy Analysis*, 29, 60–87. doi:10.3102/0162373707299706
- Hinnant, J. B., O'Brien, M., & Ghazarian, S. R. (2009). The longitudinal relations of teacher expectations to achievement in the early school years. *Journal of Educational Psychology*, 101, 662–670. doi:10.1037/a0014306
- Hughes, J. N., Gleason, K. A., & Zhang, D. (2005). Relationship influences on teachers' perceptions of academic competence in academically at-risk minority and majority first grade students. *Journal of School Psychology*, 43, 303–320. doi:10.1016/j.jsp.2005.07.001
- \*Jones, J. N., Miron, G., & Kelaheer-Young, A. J. (2012). The Kalamazoo promise and perceived changes in teacher beliefs, expectations, and behaviors. *The Journal of Educational Research*, 105, 36–51. doi:10.1080/00220671.2010.517575
- \*Jones, S. C. (1990). *The effects of the teacher expectations and student achievement program (TESA) on the reading achievement and self-esteem of suburban high school students* (Unpublished doctoral dissertation). Morgan State University, Baltimore, MD.
- Jussim, L., & Eccles, J. S. (1992). Teacher expectations: II. Construction and reflection of students' achievement. *Journal of Personality and Social Psychology*, 63, 947–961. doi:10.1037/0022-3514.63.6.947
- Jussim, L., Eccles, J., & Madon, S. (1996). Social perception, social stereotypes, and teacher expectations: Accuracy and the quest for the powerful self-fulfilling prophecy. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 28, pp. 281–388). New York, NY: Academic Press. doi:10.1016/S0065-2601(08)60240-3
- Jussim, L., & Harber, K. D. (2005). Teacher expectations and self-fulfilling prophecies: Knowns and unknowns, resolved and unresolved controversies. *Personality and Social Psychology Review*, 9, 131–155. doi:10.1207/s15327957pspr0902\_3
- \*Kerman, S. (1979). "Why did you call on me? I didn't have my hand up!": Teacher expectations and student achievement. *Phi Delta Kappan*, 60, 716–718.

- \*Kohler, P. A. (1987). *The effects of the teacher expectations and student achievement model on the achievement and self-concept of mildly handicapped students receiving resource room instruction* (Unpublished doctoral dissertation). Memphis State University, Memphis, TN.
- Madon, S., Jussim, L., & Eccles, J. (1997). In search of the powerful self-fulfilling prophecy. *Journal of Personality and Social Psychology*, 72, 791–809. doi:10.1037/0022-3514.72.4.791
- McKown, C., & Weinstein, R. S. (2008). Teacher expectations, classroom context, and the achievement gap. *Journal of School Psychology*, 46, 235–261. doi:10.1016/j.jsp.2007.05.001
- \*Perrella, C. J. (2017). *Exploring the influence of an early talent development program on teacher perceptions of giftedness in culturally and linguistically diverse students* (Doctoral dissertation, Northeastern University, Boston, MA). Retrieved from <https://repository.library.northeastern.edu/files/neu:cj82q089m/fulltext.pdf>
- Peters, J. L., Sutton, A. J., Jones, D. R., Abrams, K. R., & Rushton, L. (2007). Performance of the trim and fill method in the presence of publication bias and between-study heterogeneity. *Statistics in Medicine*, 26, 4544–4562. doi:10.1002/sim.2889
- Ready D. D., & Wright, D. L. (2011). Accuracy and inaccuracy in teachers' perceptions of young children's cognitive abilities: The role of child background and classroom context. *American Educational Research Journal*, 48, 335–360. doi:10.3102/0002831210374874
- \*Reiter, A. B., & Davis, S. N. (2011). Factors influencing pre-service teachers' beliefs about student achievement: Evaluation of a pre-service teacher diversity awareness programme. *Multicultural Education*, 18, 41–46.
- Research for Better Schools. (1987). *Teacher expectations action packet. Research, strategies and programmes for special populations*. Philadelphia, PA: Author.
- Riley, T., & Ungerleider, C. (2012). Self-fulfilling prophecy: How teachers' attributions, expectations and stereotypes influence the learning opportunities afforded Aboriginal students. *Canadian Journal of Education*, 35, 303–333.
- Rosenthal, R., & Jacobson, L. (1968). *Pygmalion in the classroom: Teacher expectations and pupils' intellectual development*. New York, NY: Holt, Rinehart and Winston.
- Rubie-Davies, C. M. (2007). Classroom interactions: Exploring the practices of high- and low-expectation teachers. *British Journal of Educational Psychology*, 77, 289–306. doi:10.1348/000709906X101601
- Rubie-Davies, C. M. (2008). Teacher expectations. In T. Good (Ed.), *21st century education: A reference handbook* (pp. 1-254–1-265). Thousand Oaks, CA: SAGE. doi:10.4135/9781412964012.n27
- Rubie-Davies, C. M. (2010). Teacher expectations and perceptions of student attributes: Is there a relationship? *British Journal of Educational Psychology*, 80, 121–135. doi:10.1348/000709909X466334
- Rubie-Davies, C., Hattie, J., & Hamilton, R. (2006). Expecting the best for students: Teacher expectations and academic outcomes. *British Journal of Educational Psychology*, 76, 429–444. doi:10.1348/000709905X53589
- \*Rubie-Davies, C. M., Peterson, E. R., Sibley, C. G., & Rosenthal, R. (2015). A teacher expectation intervention: Modelling the practices of high expectation teachers. *Contemporary Educational Psychology*, 40, 72–85. doi:10.1016/j.cedpsych.2014.03.003
- \*Rubie-Davies, C. M., & Rosenthal, R. (2016). Intervening in teachers' expectations: A random effects meta-analytic approach to examining the effectiveness of an intervention. *Learning and Individual Differences*, 50, 83–92. doi:10.1016/j.lindif.2016.07.014
- \*Smith, D. R. (2007). Changing teachers' beliefs about students and learning. In D. W. Lick & C. U. Murphy (Eds.), *The whole-faculty study groups fieldbook: Lessons learned and best practices from classrooms, districts and schools* (pp. 196–201). Thousand Oaks, CA: Corwin Press.
- Sorhagen, N. S. (2013). Early teacher expectations disproportionately affect poor children's high school performance. *Journal of Educational Psychology*, 105, 465–477. doi:10.1037/a0031754
- Speybroeck, S., Kuppens, S., Van Damme, J., Van Petegem, P., Lamote, C., Boonen, T., & De Bilde, J. (2012). The role of teachers' expectations in the association between children's SES and performance in kindergarten: A moderated mediation analysis. *PLoS ONE*, 7(4): e34502. doi:10.1371/journal.pone.0034502

- Tenenbaum, H. R., & Ruck, M. D. (2007). Are teachers' expectations different for racial minority than for European American students? A meta-analysis. *Journal of Educational Psychology*, 99, 253–273. doi:10.1037/0022-0663.99.2.253
- Timmermans, A. C., Kuyper, H., & Van der Werf, G. (2015). Accurate, inaccurate or biased teacher expectations: Do Dutch teachers differ in their expectations at the end of primary education? *British Journal of Educational Psychology*, 85, 459–478. doi:10.1111/bjep.12087
- \*Timperley, H. S., & Phillips, G. (2003). Changing and sustaining teachers' expectations through professional development in literacy. *Teaching and Teacher Education*, 19, 627–641. doi:10.1016/S0742-051X(03)00058-1
- Van den Bergh, L., Denessen, E., Hornstra, L., Voeten, M., & Holland, R. W. (2010). The implicit prejudiced attitudes of teachers: Relations to teacher expectations and the ethnic achievement gap. *American Educational Research Journal*, 47, 497–527. doi:10.3102/0002831209353594
- \*Warren, S. T. (1989). *An investigation of self-esteem, self-concept, and scholastic achievement of at-risk ninth-graders involved in the teacher expectations and student achievement (TESA) program* (Unpublished doctoral dissertation). United States International University, San Diego, CA.
- Weinstein, R. S. (2002). *Reaching higher: The power of expectations in schooling*. Cambridge, MA: Harvard University Press.
- \*Weinstein, R. S., Soulé, C. R., Collins, F., Cone, J., Mehlhorn, M., & Simontacchi, K. (1991). Expectations and high school change: Teacher-researcher collaboration to prevent school failure. *American Journal of Community Psychology*, 19, 333–363. doi:10.1007/BF00938027
- \*Williams, B., Newcombe, E., Woods, M., & Buttram, J. (1994, April). *Focusing on the professional development of urban educators: The dilemma of opportunities to change teachers' beliefs about urban learners*. Paper Presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.